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## SHORTER ARTICLES AND DISCUSSION

### THE ORIGIN OF A NEW EYE-COLOR IN *DROSOPHILA REPLETA* AND ITS BEHAVIOR IN HEREDITY

IN September, 1913, a new eye-color "scarlet," appeared in one of my cultures of *Drosophila repleta* Wollaston. The new eye color is a bright scarlet when first hatched and darkens but little with age. The eyes of the wild flies, on the other hand, are a deep mahogany which darken soon after hatching until they are almost black. This last statement is true of the stocks I have found in New York City, Woods Hole, Mass., North Manchester, Ind., Brazil, Ind., and Terre Haute, Indiana. The eye-color of the newly emerged mutant corresponds to the color chart in Ridgeway's Color Guide, Plate VII, No. 11 (Boston, 1886). The large scarlet eye in contrast to the dark body of the fly makes the new *repleta* an object of great beauty as contrasted with the wild species.

The new fly in all probability came from heterozygous stock, as is shown by the following facts. The original stock was obtained by exposing a fruit jar with banana in a fruit store in North Manchester, Indiana, September 10, 1913. From this bottle<sup>1</sup> there hatched 777 ♀♀ and 206 ♂♂ of *Drosophila ampelophila*. On November 5 appeared *repletas*. November 15, I found one scarlet female among 35 *repletas*. November 16, one scarlet male among 20 flies. November 17, one scarlet female among 25 flies. Some of the virgin flies were isolated and four scarlets appeared on January 24. My assistant, Mr. Powell, also isolated some of the original stock and later found three scarlets. This would seem to show that the stock had mutated some time before being taken into captivity. During September, 1915, I set a great many traps in the region where the above stock was taken,

<sup>1</sup> I should call attention to the aberrant sex ratio found here in *Drosophila ampelophila*. Culture from this stock later gave 491 ♀♀ and 45 ♂♂. I have data on the sex-ratio in this species for over three years and in many different stocks. With this exception I have found it approaching equality. I mated 25 pairs of virgin flies from this stock with the expectation of finding a sex-linked lethal but in each of the twenty-five bottles the sex-ratio was practically one of equality. The subsequent history of the stock was not followed, owing to an accident.

with the hope of finding whether or not scarlet was common in this region. I have bred many of the stocks since that time, but so far no scarlets have appeared.<sup>2</sup>

#### BEHAVIOR OF SCARLET IN HEREDITY

One of the original virgin scarlet females was mated to a scarlet male. The union was fruitful and a pure scarlet race was produced which has bred true since that time. The sexes are easily distinguished, the life cycle is about thirty days, and after long experience I have found it comparatively easy to breed this fly in captivity.

Scarlet was crossed to a wild stock which had been taken about four months previously in Terre Haute. This stock bred true to black eyes. The flies were studied in mass culture and virgin flies were used in crossing (the sexes were separated every 18 hours). The offspring, which had eyes like the wild stock, were mated in mass culture for the  $F_2$  generation. The following tables give the results from the crosses.

TABLE I  
SHOWING THE RESULT IN THE  $F_2$  GENERATION OF CROSSING SCARLET  
 $\text{♀} \times \text{WILD } \text{♂}$

No.	Scarlet $\text{♂} \text{♂}$	Scarlet $\text{♀} \text{♀}$	Black $\text{♂} \text{♂}$	Black $\text{♀} \text{♀}$	Total $\text{♂} \text{♂}$	Total $\text{♀} \text{♀}$	Total Scarlet	Total Black
1	57	64	139	159	196	223	121	298
2	42	27	126	85	168	112	69	211
3	73	31	148	132	221	163	104	280
4	61	61	210	166	271	227	122	376
5	72	73	263	193	335	266	145	456
6	—	—	—	—	—	—	175	530
7	—	—	—	—	—	—	52	182
Total	305	256	886	735	1,191	991	788	2,333

These tables bring out the fact that the new eye color is a simple Mendelian recessive character since it approximates the

<sup>2</sup> It is only fair to state that I had made earlier attempts to find mutations in this species. In the fall of 1911 a female of *D. repleta* was taken in the Zoological laboratory at Columbia University and from this a stock was obtained which was kept going on well-ripened bananas with more or less difficulty for more than a year. It was comparatively easy to keep the colony going in the same bottle by adding food from time to time but difficulty was experienced in founding new colonies. During the period of observation I examined many hundreds of *repletas* without finding a single mutation.

TABLE II  
SHOWING THE RESULT IN THE F<sub>2</sub> GENERATION OF CROSSING SCARLET  
♂ × WILD ♀

No.	Scarlet ♂ ♂	Scarlet ♀ ♀	Black ♂ ♂	Black ♀ ♀	Total ♂ ♂	Total ♀ ♀	Total Scarlet	Total Black
8	34	37	111	118	145	155	71	229
9	31	56	134	165	165	221	87	299
10	38	46	121	137	159	183	84	258
11	—	—	—	—	—	—	102	300
12	69	91	216	257	285	348	160	473
13	22	19	39	61	61	80	41	141
14	—	—	—	—	—	—	80	264
15	—	—	—	—	—	—	74	230
Total	194	249	621	738	815	987	699	2,194

expected ratio of three to one. There appeared in the F<sub>2</sub> generation from the scarlet male a total of 699 scarlets and 2,194 blacks,—a ratio of 3.14 black to one scarlet. From the scarlet female there appeared in the F<sub>2</sub> generation 788 scarlets and 2,333 blacks,—a ratio of 2.96 black to one scarlet. It is to be noted that the sex ratio is practically one of equality.

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### A WING MUTATION IN A NEW SPECIES OF DROSOPHILA

A NEW wing mutation which appeared in my cultures of *Drosophila confusa* Auct. (not Staeg.) is characterized by the fact that the wings curve upward at an angle of about 45 degrees from the region of the tip of the abdomen. The new wing resembles somewhat the shape of a petal of the rose and is easily distinguished from the wild species since the wings of the wild fly project horizontally over and beyond the abdomen, as is characteristic of the diptera. I shall refer to the new fly as jaunty C.<sup>1</sup>

The wild stock from which jaunty C arose was taken in an orchard on the Coss farm about seven miles south of North Manchester, Indiana, in September, 1913. The original stock was bred in a glass vial to which fresh banana was added from time to time. Several stock bottles were made up from this

<sup>1</sup> The wing is like that of jaunty in *D. ampelophila* and is here designated jaunty C(=confusa) to call attention to this resemblance.